diameter of over 500 miles, that she resembles the moon in her albedo, hence lacks an appreciable atmosphere and water, that the irregularities of her light indicate a very rough surface and rotation on her axis; lastly, that what is true of Vesta is likely to be true, *mutatis mutandis*, of the other asteroids.—On a new form of selenium cell and some electrical discoveries made by its use, by Charles E. Fritts. This new form of selenium cell has the following properties:—(1) its resistance can be made as low as desired, down to nine ohms; (2) the light is made to strike the cell in the same plane as the current; (3) it is far more sensitive to light than any before known, one cell having had fifteen times as high resistance in dark as ordinary diffused daylight in a room. Since the paper was written, the author announces the discovery of a new form of selenium, quite colourless and transparent, obtained under conditions excluding everything but selenium.—The Ischian earthquake of July 28, 1883, by C. G. Rockwood, jun. The author concludes that this disturbance had its orgin in a rupture taking place along an old volcanic fissure running roughly north and south, and extending radially under the northern slope of Mount Epomeo; and that the cause of the increased tension resulting in this rupture must be referred to the residual volcanic activity which Ischia shares with the adjacent mainland, rather than to any merely local subsidence, as suggested by Prof. Palmieri.

Annalen der Physik und Chemie, Bd. xx. No. 11, 1883.—R. Clausius, on the theory of dynamo-electric machines. This is a remarkably clear and able paper, dealing with the fundamental points in the theory of dynamo-electric machines in a masterly way, and introduces several new notions requiring the determination of the arbitrary constants in different machines. The questions of self-induction and mutual induction between different segments of the armature receive special attention. The author promises a further paper with applications of the equations.—L. Sohncke and A. Wangerin, on interference-phenomena in thin and particularly in wedge-shaped films. This paper is a continuation of one in last month's issue, giving new fundamental formulæ for Newton's rings and other interference-phenomena of thin films.—B. Hecht, on the determination of the axis-ratios of the elliptic paths in elliptic polarisation in quartz. A discussion of formulæ of Cauchy, Lommel, Voigt, and Jamin, in reference to the author's experiments.—W. Voigt, on the theory of light: a polemic against Herr Lommel respecting the latter's views on the possible intermolecular friction of the luminiferous ether.—H. Wild, on the application of his photometer as a spectrophotometer; this instrument, constructed by Hermann and Pfister, of Bern, contains a slit, a calc-spar rhombohedron, a Foucault prism, a second rhombohedron, a selenite plate, a Nicol prism, a pair of adjustable glass prisms, a 5-prism Amici direct-vision prism, and sundry lenses. The light to be examined has to pass through these successively.—Researches on forced vibrations of plates; part ii., on vibrations of square plates, by A. Elsas. This paper, which is accompanied by a set of forty-nine figures, is in continuation of a previous research on forced vibrations of round plates. The author points out that we already have the well-known researches of Chladni and Wheatstone on the figures due to natural vibrations of such plates. The aim of this research was to ascertain whether Savart's rule, that the forms of the forced vibrations merge into one another by a perfectly continuous series of modifications, is true for square plates; whether the figures corresponding to forced vibrations agree with those of the free vibrations of the same pitch; and whether the legitimacy of Wheatstone's method of superposition is confirmed or disallowed. The most important of all the results is that it is impossible for a square plate to vibrate in response to any time whatever, higher than its own fundamental, that may be forced upon it.—On Boltzmann's theory of elastic reaction, by Prof. E. Riecke; a mathematical discussion of Boltzmann's equations.—On aqueous solutions, by J. A. Groshans. A discussion of the dependence of the density of the solution on the quantity and molecular constitution of the soluble substance.—Measurement of the quantity of electricity produced by a Zamboni's pile, by Prof. E. Riecke. The values were calculated from currents traversing a long-coil galvanometer and a very high resistance.—On the galvanic-temperature coefficients of steel, rod-iron, and cast-iron, by V. Strouhal and C. Barus. For steel this coefficient diminishes as the hardness of tempering increases, while the specific resistance increases with the hardness. Glass-hard steel has about three times the specific resistance of soft steel.—On the relation between viscosity and electric resistance of solutions of salts in various solvent media, by E. Wiedemann. There appears to be no such relation as has been conjectured to exist.—On Arabian measurements of specific gravity, by E. Wiedemann.—Simplifications in experimenting with the air-pump, by K. L. Bauer, suggests the expedient already well known in England, of placing a sheet of soft caoutchouc under the receiver of the pump instead of greasing its rim; also similarly between the edges of the Madgeburg hemispheres. Gutta-percha paper is suggested as a substitute for bladder to be burst by air-pressure.

SOCIETIES AND ACADEMIES

LONDON

Chemical Society, December 20, 1883.—Dr. W. H. Perkin, F.R.S., president, in the chair.—The following gentlemen were elected Fellows of the Society:—W. P. Bloxam, A. Cobb, J. C. Chambers, A. E. Ekins, F. P. Haviland, F. Keeling, W. H. R. Kerry, J. J. Pilley, M. Percy, J. Phillips, A. W. Rogers, W. J. Saint, G. Smith, A. Smithells. The following papers were read:—Researches on the gums of the arabin group, by C. O'Sullivan. Part I. Arabic acid; its composition, and the products of its decomposition. In this most important paper the author has studied the action of dilute sulphuric acid upon arabic acid. The arabic acid was prepared by the method of Neubauer, and the sulphuric acid was allowed to act for various lengths of time from fifteen minutes to several hours. The molecule of arabic acid, $C_{89}H_{142}O_{74}$, is broken down, a series of eleven acids of gradually decreasing molecular weight (differing by $C_6H_{10}O_5$) having been isolated, and the barium salts formed and analysed; the lowest acid is $C_{23}H_{38}O_{22}$, and is comparatively stable; these acids the author calls α, β, &c., arabinosic acids. Simultaneously a series of sugars having the composition $C_6H_{12}O_6$ is formed of gradually decreasing optical activity, which the author names α, β, γ, and δ arabinose. Arabic acid is the chief constituent of all the lævorotatory gums, but other acids are present which bear a simple relation to it. In a future paper the author promises an account of the dextrorotatory and optically inactive gums, the acids of which are built up in the same manner as arabic acid.—On the decomposition of ammonia by heat, by W. Ramsay and S. Young. This decomposition commences about 500°, and is nearly equal in extent with porcelain, glass, iron, and asbestos, but at 780° ammonia is almost completely decomposed by passing through an iron tube. Copper, when heated, is not so active.—On the halogen compounds of selenium, by F. P. Evans and W. Ramsay.—On the preparation of pure chlorophyll, by A. Tschirch. This substance is obtained by the action of zinc dust on chlorophyllan (*Bot. Zeit.*, 1882, 533); its spectrum is identical with that given by living leaves.

Zoological Society, December 18, 1883.—Prof. W. H. Flower, F.R.S., president, in the chair.—Dr. F. Leuthner read an abstract of a memoir which he had prepared on the Odontolabini, a subfamily of the Coleopterous family Lucanidæ, remarkable for the polymorphism of the males, while the females remained very similar. The males were stated to exhibit four very distinct phases of development in their mandibles, which the author proposed to term "priodont," "amphiodont," "mesodont," and "telodont." These forms were strongly marked in some species; but in others were connected by insensible gradations, and had been treated by the earlier authors as distinct species. The second part of the memoir contained a monograph of the three known genera which constitute the group Odontolabini.—Mr. E. B. Poulton, F.Z.S., read a memoir on the structure of the tongue in the Marsupialia. The tongues of species of nearly all the important groups of this subclass were described in detail. It was found possible to classify the tongues in three divisions. Of these, *Halmaturus* was the type of the lowest, *Phalangista* of the intermediate, and *Perameles* of the most advanced, division.—Mr. J. Wood-Mason, F.Z.S., read a paper on the Embiidæ, a little-known family of insects, on the structure and habits of which he had succeded in making some investigations during his recent residence in India. He came to the conclusion that the Embiidæ undoubtedly belong to the true Orthoptera, and are one of the lowest terms of a series formed by the families Acridioideæ, Locustidæ, Gryllidæ, and Phasmatidæ.—Mr. G. A. Boulenger, F.Z.S., read an account of a collection of frogs made at Yurimaguas, Huallaga River, Northern Peru, by Dr. Hahnel. The collection contained examples of eighteen species, eight of which were regarded as new to science.—Mr. W. F. R. Weldon read a paper on some points in the anatomy of *Phœnicopterus* and its allies. An account was given of the air cells of the Flamingo, which were shown to differ from those of Lamellirostres, and to agree with those of Storks (1) in having the præbronchial air-cell much divided, (2) in the feeble development of the posterior intermediate cell, and (3) in the great size of the abdominal cell. The pseudopiploon was also shown to differ from that of Lamellirostres, and to agree with that of Storks, in extending back to the cloaca. A detailed comparison between the muscles, especially those of the hind limb, gave the same results. The larynx, however, being Anserine, and the skull intermediate, the position expressed by Huxley's term "Amphimorphæ" was considered fully justifiable.—Mr. Sclater read a paper, in which he gave the description of six apparently new species of South American Passeres.

Anthropological Institute, December 11, 1883.—Prof. Flower, F.R.S., president, in the chair.—The election of Mr. E. W. Streeter was announced.—Mr. Walton Haydon exhibited some photographs of North American Indians.—A paper by Mr. A. W. Howitt, on some Australian ceremonies of initiation, was read by Dr. E. B. Tylor. The ceremonies described by the author are common to a very large aggregate of tribes in the south-eastern part of Australia, and as himself an initiated person, Mr. Howitt has had unusual opportunities of observation and of obtaining information from the Blacks. When it has been decided that there is a sufficient number of boys ready for initiation, the headman sends out his messenger, who travels round to the headmen of the same totem, who then communicate the message to the principal men of the different totems which form the local groups. The messenger carries with him, as the emblems of his mission, a complete set of male attire, together with the sacred humming instrument, which is wrapped up in a skin and carefully concealed from women and children. The ceremonial meeting having been called together, that moiety of the community which called it prepares the ground and gets all ready for the arrival of the various contingents. Mr. Howitt then described at length the procession from the camp to some retired and secret place where the ceremonies are to be performed, each novice being attended by a guardian, who fully explains to him all that is said or done. A camp is formed when the spot is reached that has been fixed upon for the site of the tooth-knocking-out ceremony, which was fully described by the author in the latter part of the paper.—Dr. R. G. Latham read a paper on the use of the terms "Celt" and "German."

Geological Society, December 19, 1883.—J. W. Hulke, F.R.S., president, in the chair.—Rev. W. R. Andrews, Robert James Frecheville, and Rev. Philip R. Sleeman were elected Fellows of the Society.—The following communications were read:—On some remains of fossil fishes from the Yoredale series at Leyburn in Wensleydale, by James W. Davis, F.G.S. —Petrological notes on some North-of-England dykes, by J. J. H. Teall, M.A., F.G.S. The author described the stratigraphical relations and the structure, macroscopic and microscopic, of a number of dykes which occur in the north-east of England, giving analyses. He pointed out that they fell into four more or less distinct groups: (1) the Cleveland dyke and that of Acklington; (2) the Heth and its related dykes; (3) the dykes of Hebburn, of Tynemouth, of Brunton, of Hartley, and of Morpeth; (4) the High Green dykes. Groups (1) and (3) resembled one another in specific gravity and chemical composition, as did (2) and (4), the percentage of silica in the first two (except in the Morpeth dyke) varying from 57 to 59, and the specific gravity being about 2·7 or 2·8, while the others had a silica percentage of from 51 to 53, and a rather higher specific gravity. The former present some microscopic differences, the latter are very closely related. The Cleveland, Acklington, and Heth dykes have been examined at intervals far apart, and exhibit no variation or relation to the surrounding rocks; so that evidently they have not taken up any appreciable portion of the material through which they have broken. The dykes of Group (3) being probably pre-Tertiary (the author does not himself find it possible to distinguish igneous rocks by their geologic age) would be termed melaphyres on the Continent; but those of (2) and (4) are nearer to the group of diabases. The Cleveland dyke (Group 1) is almost certainly of Tertiary age, and its structure and composition entitle it to the name of an augite-andesite.—The Droitwich brine springs and saliferous marls, by C. Parkinson, F.G.S.

EDINBURGH

Royal Society, December 17, 1883.—Robert Grey, vice-president, in the chair.—Prof. Tait communicated a paper by Mr. A. Campbell, containing the results of additional experiments on the Peltier effect. The results agreed closely with their values as calculated from the thermoelectric diagram.—Dr. Sang read a paper on the problem of the lathe band, and on problems therewith connected.—Prof. Tait read a note by the Astronomer-Royal for Scotland, on Brewster's line Y in the infra-red. The object of the note was to point out that this line, which had been ascribed by some recent observers to air, and therefore omitted from the spectrum, is a true solar line, which has been found to be due to sodium.—Mr. John Murray read a communication by Mr. P. H. Carpenter, on the Crinoidea of the North Atlantic between Gibraltar and the Faröe Islands; with notes on the Myzostomidæ, by Prof. T. von Graff, Ph.D. —Mr. R. W. Felkin, F.R.G.S., gave a very interesting account of the Madi or Moru tribe, from which the flower of the Egyptian army has been drawn.—A paper was also read, on the structure of the pitcher in the seedling of Nepenthes, as compared with that in the adult plant, by Prof. Alexander Dickson, M.D. Prof. Dickson gave the results of his examination of Nepenthes seedlings lately raised in the Edinburgh Royal Botanic Garden. One of the most important points to which he drew attention was in connection with the annulus or rim of the pitcher orifice. In the seedlings this structure is seen even in the pitcher leaf immediately succeeding the cotyledons, and a row of cushion- or button-like glands is to be found just within its inflexed edge. From observing these glands, Prof. Dickson was led carefully to examine the annulus in the adult plant, with the result of his discovering their representatives in a remarkable series of gigantic glands. If the inflexed rim be examined, there is to be found, just above its free edge, a single line of small orifices, alternating with the ridges of the corrugated annulus and with their tooth-like prolongations, when these are present. On dissection, each of these orifices is seen to be the outlet of a canal-like fossa, from the bottom of which a cellular, nipple-shaped body or mammilla projects. This mammilla is the free apex of a gland, the great bulk of which is immersed in the parenchymatous substance of the annulus. These glands vary in length, according to the species, from 1/37 (*N. ampullaria*) to the enormous measure of 1/12 of an inch (*N. destillatoria*, *N. phyllamphora*, &c.). Prof. Dickson could not speak definitely as to the function of these glands, but thought that they probably secrete honey, affording to the insect the last drops just as it is on the brink of destruction! Sir J. D. Hooker, in his address on insectivorous plants delivered at the Belfast meeting of the British Association, had spoken of the pitcher rim as secreting honey, but without making any reference to these remarkable marginal glands.

BIRMINGHAM

Philosophical Society, December 13, 1883.—Peculiar absorption of a compound of iodine by aluminium, by Dr. G. Gore, F.R.S. This paper contains a statement of the discovery of a peculiar fact by the author, viz. that when a sheet of aluminium was simply immersed in a solution composed of 17½ grains of pure iodic acid dissolved in 3½ ounces of distilled water, it absorbed as much as ·16 per cent. of its weight of a foreign substance, and emitted a strong odour of iodine. It retained its metallic appearance, although it had become peculiarly rough by corrosion. When struck by a hard substance it emitted a less metallic sound. In several similar experiments the plates gained much more in weight by absorption than they lost by corrosion. By examining the edges of the sheets under a microscope, the sheets were found to be partly disintegrated into thin layers. A variety of other methods were tried, including electrolytic ones, to produce the same effect, but in no instance did the metal emit much odour of iodine, or appear to have absorbed freely a foreign substance. With aluminium immersed in dilute hydriodic acid containing dissolved iodine, similar though much less conspicuous effects of disintegration and emission of odour of iodine were, however, observed. By immersing a sheet of the metal in a solution of bromic acid, the metal did not appear to absorb much bromine. A partial investigation was made of the phenomena. By washing the sheets with water, the water became strongly coloured by iodine, and continued to do so after many washings. Although, after having been washed and dried, they continued to emit a strong odour of iodine, they did not by immersion in carbonic bisulphide at 60° F., during thirty-six hours, yield any iodine, or impart any colour to that liquid; the absorbed substance was not, therefore, simple iodine. A flat sheet of aluminium varnished on one side, and then immersed in aqueous iodic acid, did not assume a curved shape. A chemical analysis of the absorbed substance has not yet been made.—Reduction of metallic solutions by means of gases, &c., by Dr. G. Gore, F.R.S. This paper is a record of a number of instances in which various solutions of metals were reduced to the metallic state by contact with gases, and different organic compounds. The solutions chiefly employed were those of palladium, iridium, platinum, gold, silver, and mercury, and less frequently those of copper, lead, iron, manganese, chromium, vanadium, and tellurium. The gases used were hydrogen, carbonic oxide, coal gas, and crude acetylene. The organic compounds included both liquid and solid substances; the liquids were amylene, petroleum, benzene, Persian naptha, xylol, toluol, carbolic acid, "petroleum ether," mesitylene, and liquid chloride of carbon, and the solids were paraffin, ozokerite, naphthalene, anthracene, chrysene, elaterite, solid chloride of carbon, &c. By contact with gases the metals were generally reduced in the form of films upon the surface of the liquids, as well as in that of precipitated powder; some of the films produced, both by the contact of gases and by that of non-miscible liquids, were remarkably beautiful, and of a surprising degree of thinness. Amongst the most conspicuous instances of reduction were the following:—a solution of palladic chloride was rapidly reduced by carbonic oxide, hydrogen, coal gas, and amylene. One of terchloride of gold was quickly decomposed and reduced by coal gas, carbolic acid, and amylene. The most beautiful films were those produced by a solution of terchloride of gold, with coal gas or with amylene. Solutions of chloride of palladium were usually more rapidly decomposed than those of chloride of gold. The films of metal thus produced might prove of service in some optical and other physical investigations. It is worthy of consideration also by geologists, whether the reduction of metals to the native state in the interior of the earth may not in some cases have been effected by contact of their solutions with liquid or gaseous hydrocarbons derived from coal and other mineral substances of organic origin.

PARIS

Academy of Sciences, December 31, 1883.—M. Blanchard, president, in the chair.—Action of heat on aldol and paraldol, by M. Ad. Wurtz.—On a white rainbow (Ulloa Circle) observed at Courtenay (Loiret) on the morning of November 28, by M. A. Cornu. This extremely rare phenomenon occurred under atmospheric conditions closely analogous to those described by Bravais in the *Journ. de l'École Polytech.*, xxx. p. 97. The radius appears to have been much shorter than that of the ordinary rainbow.—Mission to Cape Horn: Summary report on the researches made in natural history and anthropology by the *Romanche*, by Dr. Hahn. In the north-eastern islands of Tierra del Fuego acquaintance was made with the Ua people, who present several remarkable peculiarities. Although living on friendly terms and even intermarrying with the more southern Yahgans, they seem to be related in stock and speech rather to the continental Patagonians. They appear even to exceed them in stature, and thus to rank as the very tallest race on the globe.—Note on the tidal curves registered between November, 1882, and September, 1883, by the maregraph at Orange Bay, Cape Horn.—Observations of the Pons-Brooks comet at the Observatory of Nice (Gautier-Eichens equatorial), by M. Perrotin.—Spectroscopic study of the Pons-Brooks comet made with the reflector of 0·50 m. at the Observatory of Algiers, by M. Ch. Trépied. The following results were obtained:—

	Comet	Flame of alcohol
Reading for line D	13°·18 ...	—
First green line (less refrangible) ...	13·92 ...	14·09
Second green line	15·12 ...	15·20
Blue line	16·76 ...	17·04

showing that in its visible parts the spectrum of the comet is identical with that of a flame of alcohol.—On the multipliers of the linear differential equations, by M. Halphen.—On a means of determining the factor of integrability, by M. W. Maximovich.—On the generation of surfaces, by MM. J. S. and M. N. Vanecek.—Reply to M. Larroque's observations on the experiments recently made in connection with the study of earth currents, by M. E. E. Blavier.—On the temperature obtainable by means of boiling oxygen, and on the solidification of nitrogen, by M. S. Wroblewski. Reserving a description of his process, the author announces as a first result an approximate temperature of − 186° C. When subjected to this intense degree of cold, nitrogen became solidified, falling like snow in crystals of a remarkable size.—On the maximum of solubility of soda, by M. E. Pauchon.—On an incomplete oxygenised monamine (oxallyldiethylmine, by M. E. Roboul.—On the fluorides of sodium, by M. Guntz.—Researches on ptomaïnes and analogous compounds, by M. A. Gabriel Pouchet.—Action of copper on the health of persons engaged in the copper industries; history of a workshop and of a village, by MM. A. Houlès and de Pietra-Santa. The history of this village (Tarn, Durfort) extends over a period of a hundred years, and tends to show that coppersmiths (forgers, braziers, &c.) are on the whole as long-lived if not more so than the agricultural population of the same district.—On the anatomy of a human embryo in the fourth week, by M. H. Fol.—On a new species of the genus Megaptera (*Megaptera indica*) from the Bay of Bassora, Persian Gulf, by M. P. Gervais.—On a rare species of Dolphin (*Orca gladiator*, Grav = *Delphinus orca*, Fab.) recently captured off Tréport, Seine-Inférieure, by M. H. Gadeau de Nerville.—On the vitelline nucleus of the Araneidæ, by M. A. Sabatier.—New ophidological discoveries, by M. Lichtenstein.—On a phenomenon accompanying the red afterglow of the sunsets of December 26 and 27, 1883, at Tortosa (Spain), by M. José J. Landerer.—Terrestrial physics: the Krakatoa catastrophe; velocity of the earthquake waves, by M. Erington de la Croix. From observations made in Ceylon, Mauritius, and other places, the earthquake wave of August 27, 1883, seems to have been propagated across the Indian Ocean at the prodigious velocity of about 550 m. per second, or 2000 km. per hour.

BERLIN

Physiological Society, December 7, 1883.—Prof. Waldeyer brought before the Society the results of investigations pursued by Herr Koganei in his Institute into the histogeny of the retina. It was known that the retina was a development of a vesicular projecting flap of the brain (*Hervorstülpung des Gehirns*), and that this membrane of the eye consisted in its early stages of fusiform cells. Whether there were other cells besides contained in it, how they were developed, and how the different constituents of the developed retina were differentiated, were, on the other hand, all matters of debate. Herr Koganei had now found that in the earliest stages this membrane of the eye was composed of two series of cells, one of fusiform cells on the distal side of the membrane, the other of round cells supplied with caryokinetic nuclei on the proximal side. The fusiform cells were called "fundamental," the round cells "prolific," these latter alone multiplying, as they did, by scission, and furnishing the whole material for building up the retina. The increase in retina elements proceeded therefore altogether from the proximal side, whence the newly-produced cells intercalated themselves into the layer of fusiform cells, all which phenomena entirely corresponded with those of the brain, it likewise growing only by multiplication of cells on the ventricular side. The differentiation of the fusiform cells into separate retina layers began after the ocular chamber was formed by the invagination of its most anterior part which becomes transformed into a double saucer shaped form, or rather it was only the innermost saucer which became the retina, while the outer saucer was converted into the pigment layer, the cells of which were filled with pigment. The differentiation followed a law of quite universal application. In every case it began on the distal side, which, on the invagination of the ocular chamber, became the inner side, and advanced gradually to the outer side of the retina. It began consequently with the oldest fusiform cells, and passed gradually over to the later-formed fundamental cells. As analogous to this was next recognised the membrana limitans interna, with the supporting fibres of Müller. These formed themselves out of the innermost layer of the oldest fusiform cells, which ranged themselves strongly out in a longitudinal direction, and became flattened on their inner end. The basal laminæ (*Fussplatten*) of these cells impinging on each other formed the membrana limitans. Then the layer of ganglion cells appeared, and, almost simultaneously, the layer of optic fibres intervening between the layer of ganglion cells and the membrana limitans. The mode by which the ganglion cells were developed was through the rounding of the fusiform cells and their emission of offshoots. With regard to the layer of nerve-fibres it was ascertained that they developed themselves out of continuations of the ganglion cells. Whether and in what manner they came later into confluence with the optic fibres proceeding from the brain was a point which must be reserved for further investigation. Prof. Waldeyer deemed it not impossible that the optic fibres growing out of the ganglion cells penetrated into the brain, and there merged into the central ganglion. Thereafter was developed the so-called molecular layer. This name had been given to it in consequence of its finely granular appearance under slight enlargement. With the powerful amplification which was now customary it was, however, at the present day, universally recognised as consisting of an extremely fine network of the most delicate filaments. In the middle of this layer Herr Koganei had found a series of round cells which, having issued from fundamental cells, formed the mother-cells of this layer. Since it was now known that cellular protoplasm consisted of a reticular coating and fluid contents, it became intelligible how, from the protoplasm of the series of mother-cells occupying the middle zone, the fine fibrous net of the molecular layer was formed by more vigorous development of the protoplasmic coating and the proportionate reduction of the liquid contents. In the further development of the embryonal retina there now appeared the internal granular layer with the median granular layer, followed, shortly after, by the external granular layer. Both granular layers developed themselves from the fusiform fundamental cells through the latter becoming round and partially emitting continuations. In this manner they formed themselves into ganglion cells, as the granules of the granular layer must be considered. The median granular layer was in the highest probability a layer of fibre-nets intercalating itself, like those of the molecular layer. In the granular layers, besides round and ganglion cells, fusiform cells were also met with. These fusiform cells, by vigorous longitudinal growth, developed themselves into supporting fibres (*Stützfasern*), flattened themselves at their extreme ends, and by superimposition of their terminal laminæ formed the membrana limitans externa. On the development of this last membrane the ganglia or granules of the granular layer began to send continuations outwards striking through the membrana limitans, which, therefore, very soon appeared occupied with the little blunt endings (*Stümpfchen*). These again grew to be granular interior members of the rods and pins that, finally, developed the hyaline external members which were powerfully refractive and cylindrical, or cone-shaped, the last members in the series of the development of retina elements. At this point the fact, of supreme importance to the physiologist, was established, that new-born animals only began to see when the exterior members of the rods and cones were developed. From the foregoing observations, Prof. Waldeyer deduced an important general conclusion, which had equal applicability to the brain as to the retina. The development of the retina demonstrated that all its morphological constituents, the ganglion cells, the nerve fibres, and the supporting fibres were developed from the same fundamental cells. The supporting fibres of the retina, and in like manner the neuroganglia of the brain, must consequently be classed as belonging to the nervous system, and having nothing in common with the ligamental tissue. They were nervous apparatus, which only did not perform nervous functions. In the case of regenerative processes, however, they played an important part. It was known that highly differentiated tissues were not capable of regeneration, which was therefore impossible in the case of ganglion cells and nerve fibres. Supporting fibres and neuroganglia, on the other hand, were capable of regeneration, and, being developed from neurously constituted cells, were also capable of undertaking nervous functions or of further differentiating themselves for those higher functions. This highly important question deserved a very thorough investigation.

VIENNA

Imperial Academy of Sciences, October 11, 1883.—On the genetic formation of the flora of New Zealand, by C. von Ettingshausen.—On isobutyl-biguanidine, by A. Smolka.—On the Diatomaceæ collected by the Austro-Hungarian North Polar Expedition in Franz-Josef Land, by A. Grumov.—On gravitation, by A. Iarolimek.—On the comet discovered by Brooks, by E. Weiss.—On some spectral analytical researches carried out with the large refractor of the Vienna Observatory, by C. H. Vogel.

October 18, 1883.—On the theory of diffusion of gases; part ii., dealing with the diffusion of a gas into itself, by L. Boltzmann.—On the quantity of work which can be obtained by chemical combination, by L. Boltzmann.—On the forms and chemical composition of the scapolith series, by F. Tschermak.

October 25, 1883.—On roemerite, botryogen, and natural magnesia iron vitriol, by T. Blaas.—Ichthyological contributions, (thirteenth paper), by T. Steindachner.

November 8, 1883.—Contributions to general nerve- and muscle-physiology; xii., on the change of the electromotor behaviour of muscles produced by electric irritation, by E. Hering and W. Biedermann.—Supplement to his paper on the quantity of work which can be obtained by chemical combination, by L. Boltzmann.—On a series of new mathematical principles, by O. Simony.—Report on the French Expedition sent to the Manihiki Islands to observe the solar eclipse of May 6, 1883, by T. Palisa.

November 16, 1883.—On the *rôle* of the inferior asteroids, by F. Chapel.—On the intercellular spaces of the epithelium of the Polmonata, by A. Nalepa.—On the axis of the tail of the comet 1827 III., by T. von Hepperger.

November 22, 1883.—Contribution to general nerve- and muscle-physiology; xiii., on Du Bois Reymond's researches on the secondary electrical phenomena of muscle, by E. Hering.—On the genetic formation of the flora of Hong Kong, by C. von Ettingshausen.—Contributions to the theory of respiratory innervation (fourth communication), by Ph. Knoll.—On the species, sub-species, varieties, and hybrids of the section Ptamica of the Achillea genus, by A. Heimerl.—Contributions to the knowledge of the fishes of the Adria, by E. Steindachner and G. Colombatovic.—Contributions to the knowledge of the chemical composition of starch-granules, by B. Bruckner.

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